

# **SUNRUNNER<sup>®</sup>**

## **APT<sup>®</sup> Power Assist Electric Tricycle**

### **USER MANUAL**



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## Introduction

Thank you for purchasing the *SUNRUNNER*<sup>®</sup> *APT*<sup>®</sup> Power Assist Electric Tricycle (hereinafter referred to as “E-Trike”) designed and manufactured by PIHSIANG MACHINERY MFG. CO., LTD. (hereinafter referred to as “PMMC”).

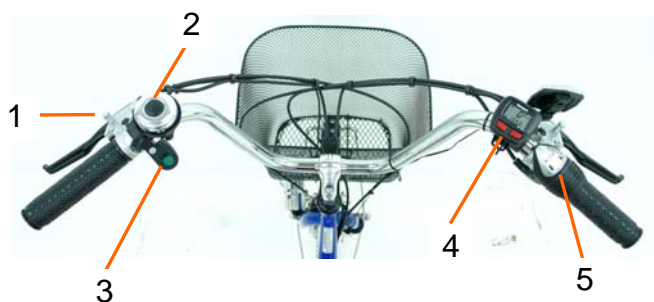
The user’s manual contains important information concerning the operation and the safe use of your E-Trike. Please read this manual carefully and thoroughly before riding your E-Trike and make sure that you fully understand the operation of the E-Trike as instructed in this manual. If you have any queries about the spare parts for the maintenance or any other concerns of your E-Trike, please contact your authorized dealer for assistance.

- ※ *SUNRUNNER*<sup>®</sup> is a registered trademark of the PMMC products.
- ※ *APT*<sup>®</sup> is registered for “Advanced Power Technologies” developed and owned by PMMC.
- ※ PMMC reserves the right to change the wording and specification without prior notice.

## Features

1. Latch	3. Go-Button Kit *	5. Gear-Shift Handle *
2. Bell	4. Speedometer *	6. Throttle Handle Kit *

\* : Optional or Equipped with the model as ordered



5Ah / 6Ah C-LiFePO<sub>4</sub>  
Battery Pack



10Ah / 13.5Ah C-LiFePO<sub>4</sub>  
Battery Pack

## Features

1. Saddle	6. Actuator & Sensor Kit	11. Basket
2. Lockable Box	7. Pedal	12. 5Ah / 6Ah C-LiFePO <sub>4</sub> Battery Pack *
3. Reflector	8. Spoke	13. 10Ah / 13.5Ah C-LiFePO <sub>4</sub> Battery Pack *
4. Pneumatic Tire	9. Hub Motor Assembly	14. Reflector
5. Wheel Rim	10. Controller (w/ Light)	

\* : Optional or Equipped with the model as ordered

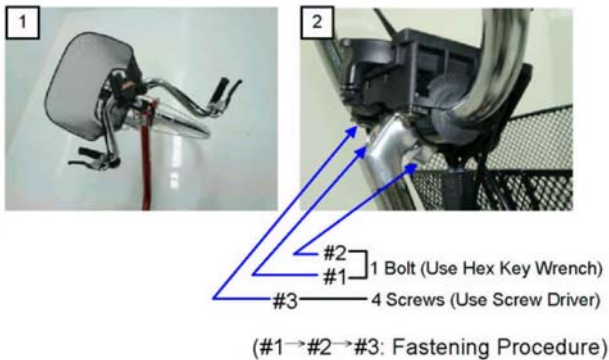


## **Safety Warnings**

1. Do not operate your E-Trike before reading this user manual thoroughly.
2. Do not disassemble the battery pack and modify the unit or your warranty will be void and you will be responsible for the modification.
3. The maximum load for the carry basket is 2 Kgs.
4. Check the tire pressure of front and rear wheels pressure to be around 50PSI (or 3.5bar) before riding.
5. Make sure that the battery pack has been fully charged before first use, and remove the charger after fully charged. Turn the main battery switch off while charging or not using.
6. Check that all electrical connections and mechanical parts are securely locked and fastened before using your E-Trike.
7. Your E-Trike is not recommended for competition, stunt, any aggressive or off-road riding. Refer to your warranty terms and conditions.
8. The performance and mileage of the unit will be varied with the battery condition, temperature, terrain, wind speed, tire pressure, rider weight and the maintenance, etc.
9. Your E-Trike is able to sense your feet's force on the pedal to provide you the assist power once you ride it. Before depressing pedal on your E-Trike, please ensure the road ahead is clear of obstacles and traffic.
10. Adjust the height of the saddle to fit your body size. Take heed of the maximum height markings on the post of the saddle. Your authorized dealer will give you assistance if requested.
11. Refer to the instruction sheet of the SunRace Inter-3 Gear to switch 3 stages of gears for a more comfortable riding at different slopes.
12. Always consult your doctor for advice on your physical condition and follow local traffic rules while riding.
13. Ensure you wear safe footwear and keep loose articles of clothing clear of moving parts of your E-Trike while riding.
14. Always handle the battery pack with care and do not drop it.
15. Do not connect the terminals of battery pack with any foreign object.

## User Guidance

### Restore the handle bar before using



Use the allen key supplied to adjust the handlebars back to the normal user position. Take care to ensure bolt is fully tightened before using the bike.

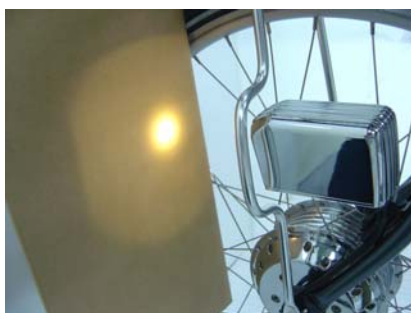
### 10 Stages Power Assist Output Adjustment



1. Turn off the power and depress the pedal while the bike is faced against the wall.



2. Press the main switch to either left (I) or right (II) position while depressing the pedal continuously.



3. After 10 seconds, the light of controller will flash as below.  
The 1<sup>st</sup> flash means the 1<sup>st</sup> stage.  
The 2<sup>nd</sup> flash means the 2<sup>nd</sup> stage.  
....  
....  
The 10<sup>th</sup> flash means the max. (the 10<sup>th</sup> stage) output from the controller. Release the pedal at once after selecting your desired stage.
4. Turn off the battery-then on to complete adjustment.

Note: 1. It's recommended you use the 1<sup>st</sup> or lower stages to save battery charge if you are riding on level ground frequently.

2. The 10<sup>th</sup> stage is the default setting on your new E-Trike.



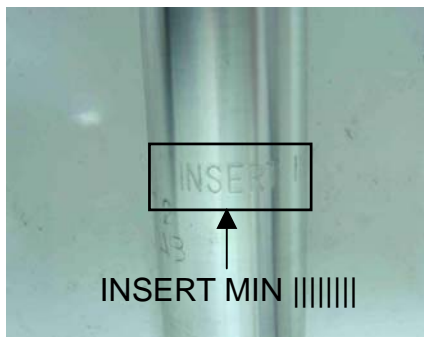
## Adjustment of the Saddle



1. Loosen the clamp lever.



2. Adjust the seat post to the desired height position.



3. Be aware of the maximum height markings (MIN. INSERTION as shown) on the tube of the saddle.



4. Ensure the saddle is aligned on your E-Trike and then tighten the clamp lever when your saddle has completely positioned.

## Cushion Adjustment for the Saddle



1. Loosen the clamp lever and withdraw the saddle connected with seat post.

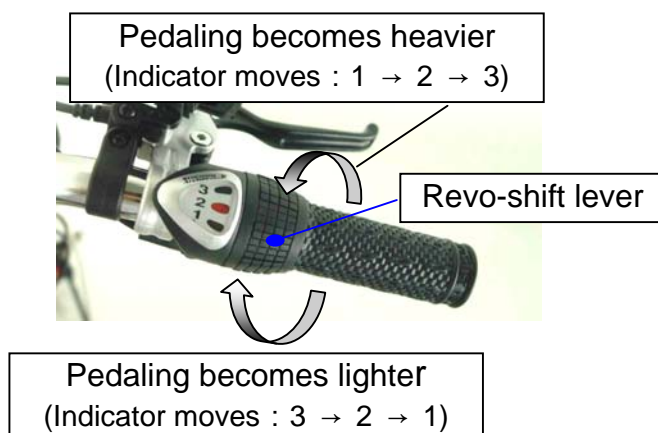


2. Using the Hex Wrench to loosen or depress the cushion to adjust to your personal comfort.

## Operating Instructions of Derailleur (SunRace Inter-3 Shift Gear)

Your E-Trike is equipped with the Sunrace Inter-3 (3-speed shift gear) at the rear wheel axle. It is easy to change the gear ratio by shifting the gear-change handle while riding.

Handle position	Riding Gradient	Speed / Gear Ratio
3	Level road	High
2	Level road with a slight slope	Middle
1	At a moderate gradient	Low (To save your energy while mounting a slope)



If the gear changes cannot be performed smoothly, please contact your authorized dealer for adjustment. To smoothly shift the derailleur, the steps as below should be followed.

1. Stop pedaling before shifting the gears while riding.
2. Only shift one gear one time while switching the gear-change handle (Revo-shift lever shown as above).
3. Resume pedaling.

Note : If you shift the gears while pedaling, a clash noise may be heard due to gears shifting over dynamic moving parts.

## Operating Instructions of Go-Button and Throttle Handle Kit \* (Optional)

The power assist of your E-Trike will remain on continuously when the Go-Button is held on or the Throttle Handle is twisted.

Note: 1. Do not use Go-Button or Throttle Handle without pedaling especially when traveling on a slope.

2. The use of the Go-Button or Throttle Handle will reduce the battery range during your ride.



## Regular Check for Safety before Riding

### 1. Check Tire Pressure before riding:

The tire pressure on front and rear tires is to be maintained at 50PSI (or 3.5Bar).

Check if the tire tread is worn excessively. If so the tire needs to be replaced.

### 2. Check Power Assist:

The power assist should cut off when one of handbrakes is engaged or the pedaling has being stopped for over 3 seconds.

### 3. Check Battery:

Check the battery pack fits into the battery mount firmly and the LED Light of the battery pack lights up when the main switch is switched on at the II position.

Check the battery is fully charged before use.

### 1. Check Motor and Control System:

Must check the motor and control system ensuring normal operation.

### 2. General Inspection:

Check if brake shoes are worn and need to be replaced.

Check if the braking function is operating correctly.

Check if the front and rear wheels are operated smoothly.

Check if all connectors on E-Trike are firmly secured without any damage.

If you have any questions after checking, please refer to the Page 19 for trouble shooting or contact your authorized dealer for inspection and maintenance.

## Riding Safety

- Always follow local traffic rules while riding.
- Check the battery gauge if the charge is sufficient to keep the power assist for your planned riding.
- The maximum loading capacity of the lockable box & front basket is 20 kgs & 2 kgs respectively. Do not overload the lockable box or basket.
- Do not keep riding your E-Trike if a problem has occurred. Refer to the solutions for trouble shooting (page 18) or contact your authorized dealer for further inspection and maintenance. Ensure to use the spare parts supplied by PMMC for replacement.

## E-Trike Care

The lifetime of your E-Trike will be adversely affected by exposures to aggressive road conditions, such as dirt, rain, water or salt spray, etc. Ensure your E-Trike, including the battery pack, are used as instructed in this manual and are protected for transportation. Always store your E-Trike indoors when not in use. This will prolong the lifespan of your E-Trike.

## Battery & Charging

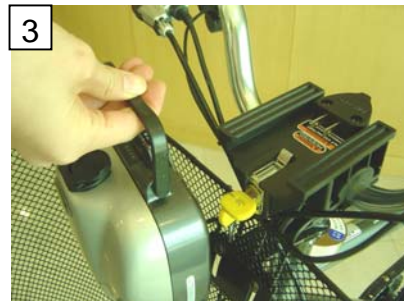
### Dismounting the Battery Pack (5Ah / 6Ah)



Unlock the battery pack by using your battery key turned flat.  
Note: Make sure the battery pack handle is latched as shown before sliding out the battery.



Depress the key to release the lock and use the other hand to push the battery pack and slide it out from the battery mount.



Hold the battery pack handle and remove it.

### Mounting the Battery Pack (5Ah / 6Ah)



Please secure the battery pack mount with one hand and slide the battery pack onto the rail of mount all the way down to lock the battery pack with the other hand as shown.  
Note: If the battery pack can be removed without depressing the key, this means that the battery pack has not been properly locked. Repeat the above procedures again.

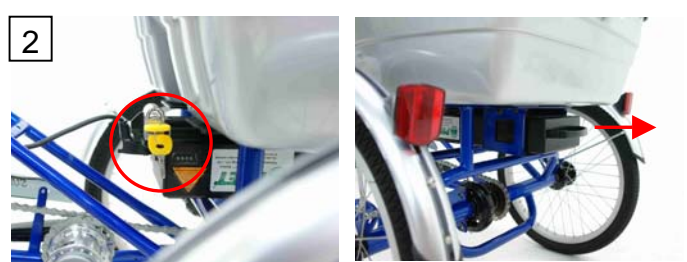


The battery pack will be securely locked and can't be removed when the key is switched toward the vertical position as shown.

## Dismounting the Battery Pack (10Ah / 13.5Ah)



Switch the battery pack off.



Unlock the battery pack by using your battery key switched to be level. Depress the key to release the lock and use the other hand to push the battery pack sliding out from the battery slide.

## Mounting the Battery Pack (10Ah / 13.5Ah)



Slide the battery pack onto the rail and all the way down to lock the battery pack with the other hand as shown.



The battery pack will be securely locked and can't be removed when the key is switched toward the vertical position as shown.

## Steps to Charge the Battery Pack (5Ah / 6Ah/ 10Ah / 13.5Ah)

1. Turn off the main switch of battery pack.
2. Dismount the battery pack (shown as Page 10, 11) and then place it at a ventilated place to be charging.
3. Swivel the charging port cover of battery pack and then connect the charger plug of the charger.
4. Plug the power plug of the charger into secure power source to start charging battery.

Note: 1. Ensure that the charger plug is dry and securely connected to the charger port of battery pack.

2. Ensure the battery pack is switched off and removed prior to charging.



## Operating Instruction

1. Ensure the input voltage is between 100V~240V.
2. Ensure the battery to be charged is a C-LiFePO<sub>4</sub> (C-Coated Lithium Iron Phosphate Based) Battery Pack supplied by PMMC.
3. Make sure the power cord, battery cable, and battery terminals are in good condition.
4. Make sure the connecting battery rating is the same as the charger output voltage (24V).
5. While charging, the charging indicator LED will display RED. When the light turns GREEN, the battery is fully charged.

## Charger LED Indication

1. LED (GREEN) – Power On, when not connected to the batteries.
2. LED (RED) – Charging
3. LED (GREEN) – Fully Charged, when connected to the batteries.

## Trouble Shooting

1. If the LED light is “OFF” all the time while charging:

Check if the power connections are in good condition. If the LED light is still off all the time while charging, the battery charger may have malfunction.

Please consult your authorized dealer for further assistance.

2. If the LED light does not switch from GREEN to RED when the charging process begins:

Check if the connection between charger plug and charging port of the battery is correctly inserted.

Check if the battery pack is already fully charged.

Check if the battery is functioned properly, and consult your local authorized dealer for assistance.

3. The charging time continues for a long duration (Irregular):

Check if the battery is faulty or aged, and consult your local authorized dealer for assistance.

4. The battery overheats:



Check your battery and charger if connected properly. Stop charging immediately and consult your authorized dealer for a detailed check if there is concern or issue with your charger or batteries.

## Caution

1. All charging will be completed within 7hrs dependant on different on the size of battery pack and charger. Do not charge the batteries for longer than 24 hours.
2. Do not expose the charger to the rain, water or a humid place. Do not use the battery charger near flammable articles or in unventilated places.
3. The battery pack is not allowed to be disassembled and should not be exposed to water or fire.
4. For your safety, do not short circuit the output plug, or it may cause unexpected danger or damage.
5. Use the specified charger only for C-LiFePO<sub>4</sub> (C-Coated Lithium Iron Phosphate Based) Battery Pack (24V) supplied by PMMC.
6. Always use the battery charger and power cord supplied by PMMC.
7. Before plugging in the power cord of the charger, please confirm that the local power supply corresponds with the requirement of the charger.
8. The manufacturer will not be responsible for any damage or injury due to improper or unsafe use of the battery charger.

## Battery Pack Feature

· Main Switch Function :

	How to operate LED Lights		Function
	 5Ah / 6Ah	 10Ah / 13.5Ah	
I	Controller	Controller & Battery Pack	Activate Power Assist
II	Controller & Battery Pack	None	
○	Power off		Stop

· The LED Light on controller and battery pack utilizes the 1W Warm White LED Light, which is a green energy and provides moderate light in the dark.

· The positions of LED light on battery pack and controller are referred to the photos as below.



LED Light of Battery Pack  
5Ah / 6Ah (starts on II)



LED light of controller  
(starts on I & II if existed)

· The portable battery pack (5Ah/6Ah) can be stored in a carrying bag supplied with each E-Trike and can be used for individual lightening system, the same as a flashlight device. Dependant on the charge of the battery, the warm white LED light can last for 3~6 days.

· The threaded hole available underneath the (5Ah/6Ah) battery pack is a connection interface to other devices for illumination, such as the camera stand as shown.



Carrying Bag of Battery Pack (5Ah/6Ah)



Battery Pack (5Ah/6Ah)  
mounted on a camera stand



## Battery Capacity LED Light Indicator



LEDs Illuminated	Percent Left of Battery Capacity	Battery Remaining Charge
All LEDs on	100%~90%	Battery pack has adequate power.
3 LEDs on, 1 LED off	65%~55%	About three-fifth capacity is remaining.
2 LEDs on, 2 LEDs off	45%~ 40%	About two-fifth capacity is remaining.
1 LED on, 3 LEDs off	25%~15%	About one-fifth capacity is remaining.
Last indicator light flashing	10%~0%	Charging the battery is recommended.

Please note that the percent left of battery capacity and battery remaining charge shown as above are listed for reference.

Warning: For your safety, do not check the LEDs of battery remaining charge while in motion it may affect your attention to the road condition. Always check the LEDs of battery remaining charge only when stopped and in a safe place.

## Riding Range per Different Capacity of a Fully Charged Battery Pack

Battery Capacity	Type- <i>Environfriendly</i> <sup>®</sup>		C-LiFePO <sub>4</sub> , 5 Ah / 6Ah / 10Ah / 13.5Ah			
	Configuration or Option (Capacity/Weight)		5Ah (1.8kg)	6Ah (1.9kg)	10Ah (3.4kg)	13.5Ah(3.9kg)
Reference Range (Remark)	Set to the top scale of power assist	60~80Kg	15~20 Km	20~25 Km	35~40 Km	50~55 Km
Specified Charger for C-LiFePO <sub>4</sub> Batteries	Charger Capacity	2A(Standard) for 5 Ah / 6 Ah / 10 Ah / 13.5Ah, 4A (Option) for 10 Ah / 13.5Ah				
	Charging Time	Approx. 2.5 ~ 7hrs depending on the charger capacity				
Remark: 1. Your riding range will vary with your weight, battery condition, temperature, terrain, wind speed, tire pressure and the maintenance, etc. 2. As the last battery indicator light starts flashing, you may continue to ride the E-Trike for approx. 1.2 Miles (2 KMs) further. 3. The maximum weight capacity of the E-Trike is around 100 Kgs.						

## Conditions that Effect Your Riding Range

Item	Conditions	Effects
1	Ambient temperature	Extreme cold and heat can consume the battery's charge more quickly.
2	Headwinds	Riding into a strong headwind will cause the motor to use more energy.
3	Road conditions	Hilly and rough terrain will cause the motor to use more energy.
4	Carrier	Carrying extra luggage on the carrier or in a basket will cause the motor to use more energy.
5	Acceleration from a standing stop	Since more energy is used during initial acceleration, riding in traffic conditions (i.e. city) that force you to start and stop often will cause the motor to use more energy.
6	Rider weight	A heavier rider will cause the motor to use more energy than with a lighter rider.
7	Proper gear usage	Pedaling in a proper gear for the terrain will help save energy for both you and the battery.
8	Poor maintenance	A dry or dirty chain and under-inflated tires can cause the motor to use more energy.

## **Maintenance**

### **Periodic Maintenance**

Please contact your authorized dealer to maintain your E-Trike periodically :

- Make sure the front and rear wheel in good condition.
- Maintain the battery pack and charger in good condition.
- Maintain the motor and controller in good condition.
- Check and maintain the brake system to keep it in good condition.
- Use lubricant to maintain metal parts of the unit, however do not lubricate the brake shoes.
- Check all electrical connections and mechanical parts are securely locked and fastened.

### **Routine Maintenance**

- Check the tire tread and tire pressure are in good condition.
- Check the battery capacity remaining charge and charger in good condition.
- Clean up the surface of your unit without spraying over all electrical connections.

## Trouble Shooting

PROBLEM	POSSIBLE CAUSE	SOLUTION
Battery pack is loose Loosening issue. (such as, battery pack could be removed when the key on battery pack is not depressed.)	Battery pack has not been totally locked onto the battery holder.	Follow the instruction to dismount then remount battery pack again to check if battery pack cannot be removed without depressing the key.
Battery gauge LEDs has no display when power on.	Battery pack charge is low or battery not connected.	Check if battery pack has been fully charged before use. Refer above if the battery pack has a loosening issue.
Power assist fails to perform its intended function when pedaling.	Controller may go to sleep mode to preserve battery charge after being idle for few minutes. Or, if one of handbrakes fails to restore to its disengaged position.	Switch power off and then back on to remove from sleep mode. Check handbrakes are totally disengaged when the levers have been released.
Power assist function discontinued when riding.	Battery pack with an empty charge.	As the last battery indicator light start flashing then the battery pack must be recharged as soon as possible, or the power assist will be discontinued after approximately 2 KMs of further riding.
Poor traveling range	Frequent riding on gradients, poor tire pressure, battery pack with insufficient charge, or battery aging, etc.	Decrease chance to ride on gradients to check if a longer range is acquired, fill up tire pressure to 50 PSI, fully charge the battery daily after use, or replace a new battery pack, etc.
Unusual motor/gear sound (noise)	Check if any foreign object obstructs wheels or motor.	Clean up obstacles around the wheels and motor.

Note: You must use the genuine *SUNRUNNER*<sup>®</sup> charger dedicated for C-LiFePO<sub>4</sub> Battery Pack to be charged.

Please contact your authorized dealer if the above solution has been checked and the problem is still exists.



## **APT<sup>®</sup> Power Assist Electric Tricycle**

### **DISCLAIMER**

Congratulations on your purchase of *SUNRUNNER<sup>®</sup> APT<sup>®</sup>* Power Assist Electric Tricycle.

This *APT<sup>®</sup>* Power Assist Electric Tricycle is not intended to be used by individuals with physical limitations that could prevent the user from operating the *APT<sup>®</sup>* Power Assist Electric Tricycle safely. PMMC disclaims all responsibility for any personal injury or property damage, which may occur as a result of improper or unsafe use of its products. Mechanical or electrical defects will be dealt with on a contingency liability basis.

Warranty is only valid when genuine *SUNRUNNER<sup>®</sup>* parts are used. All modifications on the *APT<sup>®</sup>* Power Assist Electric Tricycle, unless approved and authorized by *SUNRUNNER<sup>®</sup>*, will automatically invalidate the warranties. Standard warranty does not extend to consumable items and parties other than the original purchaser.

The preceding guidelines are intended to assist you in the safe operation of this *APT<sup>®</sup>* Power Assist Electric Tricycle. Should you have any questions about the correct operation of the *APT<sup>®</sup>* Power Assist Electric Tricycle, please contact your authorized dealers.

Model Name –*SUNRUNNER<sup>®</sup>*

Serial No.

Provider's Stamp

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